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## Search History

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Set Name side by side	Query	Hit Count	Set Name result set
DB=PGPB,USPT,USOC,EPAB,JPAB,DWPI,TDBD; PLUR=YES; OP=OR			
L6	L4 and (search$)	14	L6
L5	L4 and (search$ near criteria)	2	L5
L4	characteristic and L3	14	L4
L3	L2 and (user near context)	17	L3
L2	L1 and (physical near environment)	105	L2
L1	707/$.ccls.	25836	L1

END OF SEARCH HISTORY
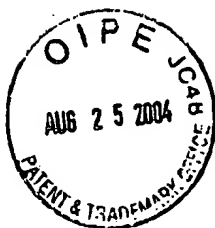
PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants	:	Kenneth H. Abbott et al.
Application No.	:	09/824,900
Filed	:	April 2, 2001
For	:	SOLICITING INFORMATION BASED ON A COMPUTER USER'S CONTEXT

Examiner	:	Jean M. Corrielus
Art Unit	:	2172
Docket No.	:	890057.411
Date	:	August 25, 2004

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Amendment Under 37 C.F.R. § 1.114
(Request For Continued Examination)

Sir:

In response to the final Office Action dated February 25, 2004 in the above-identified application, please extend the period of time for response three months, to expire on August 25, 2004, and please amend the application as follows:

Amendments to the Claims are reflected in the listing of claims beginning on page 2.

Remarks begin on page 14.

L5: Entry 1 of 2   File: PGPB   Mar 18, 2004

DOCUMENT-IDENTIFIER: US 20040054690 A1
TITLE: Modeling and using computer resources over a heterogeneous distributed network using
semantic ontologies

Current US Classification, US Primary Class/Subclass:
707/104.1

Summary of Invention Paragraph:
[0045] In further accordance with this disclosed system, a metadata component operative to
control the accessing by the search component as a function of user context and/or application
may be provided. The metadata component may be operative to apply constraints to search results
based on user authentication.

Summary of Invention Paragraph:
[0056] A system according to this aspect of the invention may include a metadata component
operative to control the accessing by the search component as a function of user context and/or
application. The metadata component is operative to apply constraints to search results based
on user authentication.

Detail Description Paragraph:
[0177] Still referring to FIG. 3, an ontology management system typically includes, but is not
limited to, the following components: a semantic broker 320, an interpretation component 322, a
semantic cache 330, and an ontology composer module 420. The semantic broker 320 includes
functionality for (i) creating, editing, updating and deleting ontologies and concepts, (ii)
creating models of computer resources through population of structural ontologies based on
computer resource characteristics, and (iii) registering, storing and accessing ontologies. The
semantic cache 330 is used to increase the efficiency of ontology queries. Any conventional
cache capable of caching XML object query results may be used with the present invention. Those
skilled in the art are familiar with the use of a cache. The ontology store 140 is a memory
device for storing an ontology.

Detail Description Paragraph:
[0181] Turning now to FIG. 4, a detailed view 400, in block diagram format, of the various
subsystems of a second, preferred aspect of the exemplary computer resources management system
110 from FIG. 1 is illustrated. Each function block in FIG. 4 represents portion, modules, and
components of the second aspect of the overall computer resources management system 110. FIG. 4
further includes communication flow lines between the various components illustrated. It should
be further understood that the components/modules illustrated in FIG. 4 are implemented as
computer program software modules or routines that execute on a computer system that is
provided for carrying out the tasks of the computer resource management system 110 as described
herein. Those skilled in the art will understand that the preferred method for carrying out
many, if not all, of the functional tasks provided for in the disclosed system may be
implemented as computer software running in a network environment with a physical architecture
of multiple computer processors configured to operate with a conventional computer operating
system, and may be deployed on a J2EE-compliant application server, such as IBM Websphere, BEA
Weblogic, or the opensource JBOSS. The application server environment provides general
transaction management including failover, load balancing, and error handling. Unless stated
otherwise, components identified in FIG. 4, which have the same name (but different reference
numerals) as components previously identified in FIGS. 1, 2, or 3, are intended to have the
same or similar characteristics to the comparable components in such previous FIGS.

Detail Description Paragraph:
[0192] The metadata component 455 intentionally limits the functionality of the search

component 457 by controlling access to the search module 457 or filtering results returned by the search module 457, as a function of the <u>context of the user</u> or application (e.g. only providing search results for what the user or application is interested or permitted to see).

Detail Description Paragraph:
[0204] Each of these web services is assumed to be described and classified according to certain criteria. In the present example the web services are classified based on criteria of "cost," "quality," and "availability." Of course, many other objective and subjective attributes or <u>characteristics</u> may be associated with the various web services. But for purposes of the present discussion, only these three will be referenced. In this example, "cost" and "quality" are assumed to exist on a numeric scale from 0-10, and each of the particular web services has been assigned a "cost" or "quality" level that will be useful as this discussion example unfolds. In practice, the business entity associated with the system user 151 may utilize extensive classification criteria for defining and describing the web service. In accordance with the present invention, these additional attributes are considered meta-data, which are incorporated into the system as part of the web service classification ontology, discussed in greater detail hereinafter.

Detail Description Paragraph:
[0207] At Step 721 the system user 151 classifies the web service and describes basic <u>characteristics,</u> from the viewpoint of the system, that will index and classify the system. An example of such indices include whether the web service is private or publicly-accessible and, if private, what ID-password combination is required to invoke the web service. The system user 151 may provide additional information describing the web service and/or its attributes, <u>characteristics,</u> features, quality, and other objective or subjective information that may not be revealed by the web service itself or that may be pertinent to the particular business entity or entities that invoke the web service. The end result of providing such additional information is providing specific attributes for classifying the web service through the creation of meta data that populates an instance of the web services classification ontology 732 and is stored in the ontology store 140 in conjunction with the corresponding web service structural ontology 730 for this web service. A specific web service classification ontology consistent with the present example will be described in connection with FIG. 13B.

Detail Description Paragraph:
[0225] In evidence in the XML schemas are the structural <u>characteristics</u> of the description logics of DAML as an exemplar of ontologies. Illustrated in the present example are class, sub-class, objectproperty, resource, and ID. Classes are groups of objects that have similar <u>characteristics</u>. Subclasses inherit the <u>characteristics</u> of the classes but reflect a limited sub-set of properties. Objectproperties are themselves classes and define class properties and relationships. These are predicate relationships in the subject-predicate-object structure. Resources are things described by RDF expressions (e.g., web pages, part of a web page, collections of web pages, objects not directly accessible via the web) named by a URI or optional anchors or identifiers. ID describes a specific type of a class.

Detail Description Paragraph:
[0234] By way of example and not limitation, Service 1110 has a number of descriptive properties (objects) illustrated. In other words, Service 1110 is classified by Cost 1112, Quality 1114, and Availability 1116. It should be understood that many additional and potential properties (not shown) could have been included to provide even more detail in describing relevant properties (such as "convenience," dependability," and the like) that a Service 1110 may have and that may serve as classification criteria, indices, further <u>characteristics,</u> or characterizations of the Service 1110. It should also be noted that both Cost 1112 and Quality 1114 have been defined to have a rating expressed as an Integer 1118. Conversely, Availability 1116 has been defined to have a rating expressed as three possible "word" values: Always 1120, Periodically 1122, and Seldom 1124. As will be appreciated by one skilled in the art, the range of possible properties for Cost, Quality, and Availability is arbitrary and innumerable. For example, Cost could have been defined to have possible values of "Expensive," Moderate," and Cheap;" Quality could have been defined to have possible values of "4 Star," "3 Star," "2 Star" or "1 Star;" and Availability could have defined to have an integer value or to have other possible values, such as "Business Hours," "Weekends," and "24/7." Finally, ontology 1100 illustrates that Service 1110 is a "subclass of" Service 950 (defined previously in FIG. 9). This makes clear that this classification ontology will be applicable to any web service structural ontology defined in FIGS. 9 and 10.

Detail Description Paragraph:
[0287] FIG. 29 illustrates a third semantic mark-up display screen 2900 that shows a list of available business information model ontologies in field 2920 that are available for association with the previously-selected web service. The available business information model ontologies are displayed after entering appropriate <u>search criteria</u> in fields 2930 or 2940 and selecting the browse button 2910. A selected business information model, such as the "airline ontology" (i.e., "airline reservation schema"), is selected for further operations as described in greater detail below.

Detail Description Paragraph:
[0304] First, the system user 151 initiates a search based on particular concepts and search parameters, using the vernacular that the system user believes may result in retrieving the web services that the system user desires to mark up. The system user inputs certain parameters that are passed to the mark-up module 444 (using a display screen such as that shown in FIG. 27), which in turn provides these parameters to the search module 457. The search module 457 is responsive to pass a message to the metadata service 455 to retrieve the system <u>user's</u> "context." The user context identifies what web services the user is entitled (or not entitled) to receive, access and mark-up and what web services are relevant (or not relevant) to the particular system user in response to the search request. Such context information is returned by the metadata service 455 to the search module 457. The search module applies the <u>user</u> <u>context</u> information to filter the <u>search criteria, which search</u> is then run against the resource registry 142 to identify relevant web services. The list of web services identified by the search is returned to the mark-up component 444 (and displayed to the user, for example, as shown in field 2720 of FIG. 27). After the user selects the desired web service, the instance data contained in the web service structural ontology for the service is returned to the Markup module 444. The user selects a desired method or operation provided by the web service for mark up (see e.g. FIG. 28).

Detail Description Paragraph:
[0305] The next step taken is the location of applicable business information model ontologies for association with the selected web service ontology. The mark up component 444 communicates with the Atlas 442, which responds by querying the ontology store 140 to retrieve any pre-stored business information models that may be relevant for association with the ontological model of the selected web service. The <u>user's context</u> is applicable in filtering, if necessary, what business information models are available to the system user and, thus, returned to the markup component 444. The user then associates properties of the ontological model of the web service with relevant concepts of the business information models to create a binding therebetween, as shown in FIGS. 30-31. If necessary, the markup component 444 requests transformation ontologies (see, e.g., FIGS. 32-33) from the Atlas 442, which in turn, queries the ontology store 140 for the same, which then responds by returning any appropriate transformation/mark up ontologies to the mark up component 444. After entering any applicable information necessary for associating the transformation ontology with the properties of the web service, the mark up component 444 sends such meta data to the Atlas 442, which writes the information to the ontology store 140. The mark up component 444 also registers the transformation ontology in the resource registry 142. If desired, the user is also able to specify default values (see FIG. 34) for any of the "input" properties of the web service. Once the user is finished configuring the association between the web service and the business information model(s), a SIM model is created. The mark up component 444 sends such SIM model to the Atlas 442, which writes the information to the ontology store 140. The mark up component 444 also registers the SIM model in the resource registry 142 and meta-data is bound to the model to create classification information. Classification information may include such information as when and how the SIM model should be used. Specifically, relevant business contexts, such as business processes or integration efforts, for defining the web service may be defined.

Detail Description Paragraph:
[0306] FIG. 42 illustrates the execution modeling process wherein a system or end user 151,126, respectively, retrieves pre-stored business information models (or concepts), configures and inputs parameters for invoking the same, and combines, assembles, or chains multiple such business information models or concepts to create a complex computing task. In particular, the user initiates the execution modeling process by launching the model editor component 425. The user then enters any desired search terms into a search display screen. The model editor 425

passes the search terms to the Atlas 442, which responds by retrieving any appropriate <u>user</u> <u>context</u> from the metadata service 455, which, in turn, returns any applicable <u>user context</u> information, such as access privileges to the particular business information models and ontology concepts.

Detail Description Paragraph:
[0307] The Atlas component 442 uses the <u>user context</u> information to construct an appropriate query to the ontology store 140, limited by any applicable <u>user context</u> information provided by the metadata 455. Any retrieved business information models or ontology concepts are returned in the form of the ontologies (and concepts) that will be available to the user for creation of an execution model. Once the user has retrieved all desired business information models and concepts (after one or multiple searches), the user proceeds to the model editor graphical display screens, such as those shown in FIGS. 35-37, to configure an execution model. Upon completion of any edits to the execution model, the model editor 425 "sets" or "saves" the execution model by communicating with the Atlas 442, which writes the model to the ontology store 140. The model editor 425 also registers the execution model in the resource registry 142. During the registration of the execution model, the user binds meta-data to the execution model instance which provides index and classification information to assist in model discovery. Further, the registration process creates a unique identifier for the model so that the model can be invoked at a future time by a system 128 or system user 151 who passes the model identifier as a parameter. Thereafter, the created or edited execution model ontology is available for further utilization by others, or further access by the user.

Detail Description Paragraph:
[0309] To perform the "discovery process," the interpretation module 422 forwards the execution model to the mark up component 444, which queries the Atlas 442 to find and retrieve web service ontologies from the ontology store 140 that have been associated, through the mark up process, with the relevant business information models. Specifically, the mark-up component 444 creates queries of relevant SIM models to determine the associations between the business information models and the web service ontologies. Web service ontologies that meet the constraints specified in the execution models will be identified based on information contained in the SIM models. The Atlas 442 then communicates with the inference module 450, which compares the parameters and restrictions requested by the user with the <u>characteristics</u> and classifications of each potential web service (see, e.g., discussion associated with FIG. 39). Once a "best" web service ontology has been identified by the inference module 450, such information is returned and provided to the interpretation module 422 to apply any necessary transformation ontologies to the information and parameters input as part of the execution model and as applicable to the web service identified by the inference module 450. The interpretation module 422 then forwards the execution model, with relevant transformation ontologies, to the execution model 430 (see FIG. 45).

Detail Description Paragraph:
[0311] The public service 415 communicates with the interpretation module 422, which "holds" the execution model until the "discovery process" has been completed. To perform the "discovery process," the interpretation module 422 forwards the execution model to the mark up component 444, which queries the Atlas 442 to find and retrieve web services ontologies from the ontology store 140 that have been associated, through the mark up process, with the relevant business information models. This is accomplished through queries of the SIM models. The Atlas 442 then communicates with the inference module 450, which compares the parameters and restrictions requested by the user with the <u>characteristics</u> and classifications of each potential web service. Once a "best" web service ontology has been identified by the inference module 450, such information is returned and provided to the interpretation module 422 to apply any necessary transformation ontologies to the information and parameters input as part of the execution model and as applicable to the web service identified by the inference module 450. The interpretation module 422 then forwards the execution model, with relevant transformation ontologies, to the execution model 430 (see FIG. 45).

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L5: Entry 2 of 2　　　　　　　　　　　　　　File: PGPB　　　　　　　　Jul 4, 2002

DOCUMENT-IDENTIFIER: US 20020087525 A1
TITLE: Soliciting information based on a computer user's context

Abstract Paragraph:
A user search request is received and context information for the user is identified. The user
search request and the context information are then combined to generate search criteria
corresponding to the user search request, providing for information solicitation based on a
computer user's context.

Current US Classification, US Primary Class/Subclass:
707/3

Summary of Invention Paragraph:
[0002] This disclosure relates generally to computer-assisted solicitation of desired
information, and more particularly to soliciting information based on a computer user's
context.

Summary of Invention Paragraph:
[0008] Soliciting information based on a computer user's context is described wherein.

Summary of Invention Paragraph:
[0009] According to one aspect, a user search request is received and context information for
the user is identified. The user search request and the context information are then combined
to generate search criteria corresponding to the user search request. The context information
includes, for example, information regarding one or more of: the user's physical environment,
the user's mental is environment, the user's computing environment, and the user's data
environment.

Summary of Invention Paragraph:
[0010] According to another aspect, a product interest characterization (PIC) is generated that
includes multiple fields, some fields being populated with user-defined data inputs and other
fields being populated with automatically-generated user context information. The generated PIC
is then communicated to one or more information sources where the PIC is compared with
information at these sources to identify content that matches the parameters in the various
fields of the PIC. The matching content is then presented to the user.

Brief Description of Drawings Paragraph:
[0014] FIG. 4 is a flowchart illustrating an exemplary process for soliciting information based
at least in part on the user's context.

Detail Description Paragraph:
[0020] This disclosure describes soliciting information for a user based at least in part on
the user's context. Search parameters or other data associated with a user's search request is
combined with context information for the user to generate search criteria. The search criteria
can then be compared with data (stored locally and/or remotely) to identify information that
matches the search criteria. The user is able to solicit any of a wide variety of information,
such as advertisements (e.g., of products or services), reference materials (e.g., electronic
books or articles), as well as actual goods or products themselves (e.g., in electronic form
(such as audio content that can be downloaded and played immediately), or for more traditional
physical delivery (such as ordering a coat and having it shipped via an overnight shipping
agent)).

Detail Description Paragraph:
[0034] A more detailed explanation of the CDOS system 120 may be found in a co-pending U.S. patent application Ser. No. 09/216,193, entitled "Method and System For Controlling Presentation of Information To a User Based On The User's Condition", which was filed Dec. 18, 1998, and is commonly assigned to Tangis Corporation. The reader might also be interested in a more detailed discussion of context attributes (or condition variables) discussed in U.S. patent application Ser. No. 09/724,902, entitled "Dynamically Exchanging Computer User's Context", which was filed Nov. 28, 2000, and is commonly assigned to Tangis Corporation. These applications are hereby incorporated by reference.

Detail Description Paragraph:
[0035] An optional information solicitation manager 178 is also shown stored in memory 172 and executes on processing unit 170. Information solicitation manager 178 utilizes data from CDOS system 120 to generate search criteria based on the user's current environment. Alternatively, information solicitation manager 178 and CDOS system 120 may be implemented at a remote location (e.g., not in close physical proximity to the user 150).

Detail Description Paragraph:
[0038] User search requests are input to an information solicitation management component, which, in the illustrated example, is a product interest characterization (PIC) manager 212. PIC manager 212 receives the user request and combines the request with the user's current context from context awareness model 214 in order to generate search criteria. The generated search criteria is then communicated to the locally and/or remotely situated information source 102. The search criteria is compared to the information at source 102 (e.g., an Internet search engine) to determine what information (if any) at source 102 matches the search criteria, and optionally how well that information matches the search criteria. The results of the comparison are then returned to PIC manager 212, which returns the results as appropriate to output device (s) 210 for presentation to the user. The results returned to PIC manager 212 may be sufficient to present to the user, or alternatively may only identify content that needs to be accessed by PIC manager 212 and presented to the user. For example, the results returned to PIC manager 212 may be a set of uniform resource locators (URLs). Those URLs may be presented to the user, or alternatively PIC manager 212 may access the locations identified by those URLs and return the content at those locations for presentation to the user.

Detail Description Paragraph:
[0039] Context awareness model 214 maintains context information for the user, allowing a characterization module 216 to attempt to characterize the user's context (e.g., his or her current context at the time a user search request is made by the user and/or received by PIC manager 212) and communicate this context information to PIC manager 212. Context awareness model 214 is built based on input from various modules 218, 220, 222, and 224 that capture and pass information based on inputs from one or more sensors 226 (e.g., environment sensors 164, user sensors 162, etc. of FIG. 2). Sensors 226 monitor the environment parameters and provide data to the modules 218-224, and can be local to the user and/or remote from the user. Sensors 226 can be any transducer or software module that provides data used (or potentially used) in the context awareness model 214.

Detail Description Paragraph:
[0040] In the illustrated implementation, the context awareness model 214 gathers information on (1) the user's physical environment from module 218, (2) the user's mental environment from module 220, (3) the user's computing environment from module 222, and (4) the user's data environment from module 224.

Detail Description Paragraph:
[0041] Physical environment module 218 generates information pertaining to the user's present location (e.g., geographical, relative to a structure such as a building, etc.), the current time, and surrounding objects that may be used as a basis for searching. As an example of this latter situation, a user with a wearable computer may be traversing through a mall having numerous stores therein. While in this location, the user may request product sale information and only advertisements of products sold in stores in the mall and currently on sale are presented to the user.

Detail Description Paragraph:
[0042] The mental environment module 220 generates information pertaining to the user's likely

intentions, their preferences, and their current attention. For instance, the mental environment module 220 may use data from a pupil tracking sensor or head orientation sensor to identify a direction or object on which the user is focused. If the user appears to be focused on administrative items presented on the heads up display, then the <u>user context</u> module 220 might determine that it is safe to present search results.

Detail Description Paragraph:
[0044] The <u>search criteria</u> generated by PIC manager 212 is encapsulated in a data structure referred to as a PIC. A PIC is the data that is sent from the consumer computing system (e.g., PIC manager 212) to information sources 102. If the information provider determines that there is content that sufficiently conforms to the consumer's interest (e.g., matches all of the <u>search criteria,</u> or at least a threshold amount of the <u>search criteria</u>), an indication of a match, optionally with product description information and other commerce facilitating code and data, can be sent to the consumer.

Detail Description Paragraph:
[0046] PIC manager 212 is thus able to formulate <u>search criteria</u> (e.g., in the form of PICs) encompassing a wide variety of different information. This can include, for example, basic keyword inputs by the user which are then combined with other formation (e.g., from context awareness model 214) by PIC manager 212 to formulate the <u>search criteria</u>.

Detail Description Paragraph:
[0047] FIG. 4 is a flowchart illustrating an exemplary process for soliciting information based at least in part on the <u>user's context</u>. The process of FIG. 4 is performed by, for example, PIC manager 212 of FIG. 3, and may be implemented in software.

Detail Description Paragraph:
[0048] Initially, user input is received (act 252). The current <u>user context</u> is then identified (act 254), and <u>search criteria</u> (e.g., a PIC) generated based on both the received user input and the identified <u>user context</u> (act 256). A search is then performed for information that satisfies the <u>search criteria</u> (act 258). The search may be performed by the component that generates the <u>search criteria</u> (in act 256), or alternatively the search may be performed by communicating the <u>search criteria to a search</u> component (e.g., an information store 102 of FIG. 3). Once the search is at least partly completed, the search results are presented to the user (act 260). Search results may be presented to the user as they are received by PIC manager 212, or alternatively after all searching has been completed.

Detail Description Paragraph:
[0049] One example of soliciting information involves the user passing (walking, riding, driving, etc.) a store and submitting an advertisement search request. The <u>search criteria</u> include the advertisement request as well as context information indicating that the user is in close proximity to the store. The search results include an advertisement that the store is selling a product (e.g., a specific brand of cigarettes, including cigarettes the <u>user's context</u> knows that the user has purchased in the past) for a price that the user may be willing to purchase the item (e.g., the cigarettes are on sale, or cheaper than other stores, or cheaper than the users last purchase of cigarettes). The cigarette advertisement is thus presented to the user. In general terms the <u>user's context</u> determines whether a particular criteria is met and presents an advertisement (in this case, generated by the store, but not directed at specific consumers) to the user.

Detail Description Paragraph:
[0062] New PIC data store 352 is used to generate a unique PIC. Data store 352 can contain different types of information, such as information provided by the user to characterize new information (e.g., a new product) of interest. Data store 352 may also include information previously provided by the user to characterize other information (e.g., product(s)) of interest. This information may be included because the user indicated a desire to have PICs with similar fields share values as default. Additionally, system-suggested information may also be included. For example, based on previous PICs, the system can suggest PIC fields and values based on previous user behavior. A more detailed explanation of such predictive behavior can be found in a co-pending U.S. patent application Ser. No._____, entitled "Thematic Response To A Computer <u>User's Context,</u> Such As By A Wearable Personal Computer" to James O. Robarts and Eric Matteson, which was filed_____, and is commonly assigned to Tangis Corporation. This application is hereby incorporated by reference.

Detail Description Paragraph:
[0065] Generic product characterization data store 358 allows the user to rely on recognition rather than recall to create a PIC. This is valuable because the PIC fields required for the precise characterization of a product interest are significantly different for different types of products, and there are many of them, and they can change over time. Therefore, a generalized taxonomy of generic products is provided, that can be navigated (e.g., hierarchically, graphically with pseudo-spatial relationships, keyword searched, and so forth) similarly to actual product catalogs (e.g., online Yellow Pages). As the user traverses the data store, he or she can both be learning about general product characteristics (new luxury SUVs are available from which manufacturers, in a bounded price range), and providing candidate fields and values for the PIC Builder (for storage in data store 358).

Detail Description Paragraph:
[0068] Returning to FIG. 5, once a PIC is generated and made active by user 316, the PIC is made available to PIC sender 310 which distributes the PIC to one or more information sources 302 and/or 304. One or more sending options for the PIC may also be identified by the user or automatically (e.g., based on the user's context). The sending options identify how, when, and/or where the PIC is sent. For example, the PIC may be saved until bandwidth is available, or collected in a set of PICs (e.g., perhaps purchases of products need to be coordinated: medication, scuba diving equipment, computer hardware & software). Once the sending options have been indicated, the actual process of sending a PIC and receiving responses can be transparent to the user. The user may simply see the results of the query.

Detail Description Paragraph:
[0074] In addition, PIC receiver 312 may use the user context to determine how filters get applied to the content. For example, a user may generate a PIC for information about changing a flat tire. However, the search may take a long time and the results of the search may not be returned to PIC manager 212 until after the user has fixed the flat tire. In this situation, the appropriateness filter can filter out the search results and not have them presented to the user because based on the user context (the flat tiring having been fixed), the search results are no longer important to the user.

Detail Description Paragraph:
[0075] PIC receiver 312 (or alternatively presentation manager 314) may also communicate with context awareness model 214 or characterization module 216 of FIG. 3 to present information in an improved form. Context model 214 includes logic that describes functional and presentational characteristics of a desired UI for the current user context. This may include UI layout, selection of presentation surface, privacy, and so forth.

Detail Description Paragraph:
[0081] Immediately notify the user--notification can include terse message (a PIC has a match, a particular PIC has a match) or arbitrarily complex descriptions. Descriptions could scale to the entire correlation result (a composite value of strength of match, description of what characteristics do or do not match, source of product, supplemental information provided by PIC Broker including ID, recommendations or review of product or product provider, suggestions).

Detail Description Paragraph:
[0084] Once generated, the PIC is communicated by PIC manager 452 to a PIC receiver 454 at PIC broker 450. The PICs 456 from this user, as well as other PICs 458 from other users, are made available to a correlation logic 460. Correlation logic compares the search criteria in the PICs 456 and 458 to multiple product characterizations 462(1), 462(2), 462(3), . . . , 462(X). Any of the product characterizations 462 that satisfy the search criteria are communicated to the product provider(s) 464 corresponding to the matching product characterization(s), which in turn provide the corresponding product information (or the product itself) to the user computing resources 466 (e.g., a client 106 of FIG. 2). Correlation logic 460 may also optionally provide the product characterizations 462 that satisfy the search criteria to the user computing resources 466. The product information or characterization received at resources 466 may also be filtered by filter 468, which may prevent presentation of the information or characterization, or delay its presentation until an appropriate time.

Detail Description Paragraph:
[0086] Yet another example is a content aggregator. Much like a PIC broker, content aggregators

can provide interfaces to their data stores compatible with the <u>user's context</u> model (or vice versa, any party can provide a dictionary and write the translation filter). In this scenario very tight control on the product descriptions, including availability, can be provided, insuring timely and accurate product offers. There can also be cooperation between different user models. For example, a variety of affinity mechanisms may be used which suggest products that are similar to the ones requested. The <u>user's context</u> models can directly, or thru the PIC Manager mechanism, indicate if this type of information is desired. The models can also cooperate by sharing the user's desire to have products having a high-correlation (clearly satisfying the PIC) be automatically purchased. Necessary information for purchase can also be exchanged securely.

Detail Description Paragraph:
[0089] Various aspects of the solicitation of information described herein can be seen from the following examples. A first example is the purchase of a child car seat. Assume that a user has a computer that maintains an explicit, extensible, dynamic model of his or her context. The user has used this model to maintain a data store of personal, detailed, private information, as well as information that is shared with others and available publicly. He or she is about to become a first time parent, and wishes to purchase a car seat for the new infant, but does not have familiarity with car seats and does not have a lot of time for research. Further, he or she understands that there are likely trade-offs between product <u>characteristics</u> such as price and safety.

Detail Description Table CWU:
1TABLE I Infor- mation Description Keywords A distillation of desired information (e.g., product <u>characteristics</u>). Keywords are typically chosen for brevity and precision, and can serve as search terms for many of the currently available Internet search engines. Context Contain any data (e.g., name/value pair(s)) characterizing the Awareness user's current or past context. Based on information Attributes received from the characterization module. Security Allows some or all PIC data to be read by only intended Keys recipients. This may be optionally included when security issues are important to the consumer and/or the information provider. Internet Allows an Internet site to identify and profile a particular Cookies consumer. This may be optionally included by the user to facilitate repeat business or information requests. User Information the user may wish to include to more fully Comments characterize their interests. Note that information providers may supplement their automated processes with people who can review PICs of interest. It should therefore not be assumed that a PIC must contain only machine understandable data. For instance, a PIC can be in the form of an audio file, which the user recorded and has the computer send to product information providers' telephony systems. Code Support a variety of executable code formats. For instance, information providers may support advanced queries using SQL, or automatic purchase mechanisms may be shared. These mechanisms may first be provided by the information provider, and then included in the PIC during subsequent purchase requests. May be used to support the convenient purchase of items satisfying a sufficient number of parameters in the PIC. Filters A special case of code. Filters aid the interpretation of interest characterizations. They can also be used by the information return process to restrict when search results are presented to the user. Auth- Allows the user to indicate how much data can be provided orizations to different classes of product information providers. This information can include purchase-enabling information like credit card numbers. This is part of a general CA permissioning scheme, that supports dynamic authorizations. Therefore, depending on the current <u>context of the user,</u> the PIC can change its: exposure (who sees it), content (what it contains), and validity (how well does it match desired goods, services, or information). Consumer Provides an identification of the user. This identification Ident- may not necessarily correspond with any legal identification. ification For instance, it may be unique to a particular product information provider, or class of product information provider. PIC Identifies what version of the PIC manager the PIC data is Version conforming to. PIC Securely identifies the origin of the component generating Cert- the PIC. ificates PIC Describes the fields included in a particular PIC, as well as Descrip- their purpose and use. tion Previous Provides search facilities with a history of what the Search consumer has already been provided, so, among other Results functions, allows the search engine to eliminate providing repetitive information. Weighting Characterizes what the consumer found interesting in previous information searches. Purchase Characterizes what the consumer had previously purchased. History In some cases, this information can be very detailed and so provide a rich product interest characterization.

CLAIMS:

1. A method comprising: receiving a user search request; identifying context information for the user; and determining <u>search criteria</u> corresponding to the user search request by combining the user search request and the current context information.

2. A method as recited in claim 1, further comprising performing a search of an information source using the <u>search criteria</u>.

7. A method as recited in claim 1, further comprising: communicating the <u>search criteria</u> to one or more search components; receiving search results from at least one of the one or more search components; and presenting the search results to the user.

12. A method as recited in claim 11, wherein the <u>search criteria</u> is to be submitted to one or more search components via a network, and wherein the product is to be returned to the user via the network.

13. A method as recited in claim 11, wherein the <u>search criteria</u> is to be submitted to one or more search components via a network, and wherein the product is to be returned to the user via shipping external from the network.

14. A method as recited in claim 1, wherein the context information comprises information regarding one or more of: the user's <u>physical environment,</u> the user's mental environment, the user's computing environment, and the user's data environment.

15. A method as recited in claim 1, wherein the context information comprises information regarding two or more of: the user's <u>physical environment,</u> the user's mental environment, the user's computing environment, and the user's data environment.

16. A method as recited in claim 1, wherein the context information comprises <u>physical environment</u> information pertaining to one or more of: the user's present location and the current time.

20. A method as recited in claim 1, further comprising: generating a profile corresponding to the user; and saving the <u>search criteria</u> associated with the search request as corresponding to the profile.

27. One or more computer-readable media as recited in claim 23, wherein the context information comprises information regarding one or more of: the user's <u>physical environment,</u> the user's mental environment, the user's computing environment, and the user's data environment.

28. One or more computer-readable media as recited in claim 23, wherein the context information comprises <u>physical environment</u> information pertaining to one or more of: the user's present location and the current time.

34. One or more computer-readable media as recited in claim 23, further comprising computer-executable instructions that, when executed, direct the computer to: communicate the <u>search criteria</u> to one or more search components; receive search results from at least one of the one or more search components; and present the search results to the user.

36. A method comprising: sensing a current <u>context of a user</u>; generating <u>search criteria</u> based at least in part on the current <u>context of the user</u> and one or more search parameters identified by the user; and retrieving, from one or more information sources, information satisfying the <u>search criteria</u>.

37. A method as recited in claim 36, wherein the current context comprises information regarding one or more of: the user's current <u>physical environment,</u> the user's current mental environment, the user's current computing environment, and the user's current data environment.

38. A method as recited in claim 36, wherein the current context comprises information regarding two or more of: the user's current <u>physical environment,</u> the user's current mental environment, the user's current computing environment, and the user's current data environment.

39. A method as recited in claim 36, wherein the current context comprises <u>physical environment</u> information pertaining to one or more of: the user's present location and the current time.

46. One or more computer-readable media as recited in claim 45, wherein the current context information comprises information regarding one or more of: the user's <u>physical environment,</u> the user's mental environment, the user's computing environment, and the user's data environment.

47. One or more computer-readable media as recited in claim 45, wherein the current context information comprises <u>physical environment</u> information pertaining to one or more of: the user's present location and the current time.

51. A method comprising: receiving a search request; identifying user-input parameters corresponding to the search request; identifying <u>user context</u> parameters, corresponding to the search request , that represent a <u>context of the user</u>; comparing both the user-input parameters and the <u>user context</u> parameters to data describing content; and identifying content, based at least in part on the comparing, that matches both the user-input parameters and the <u>user context</u> parameters.

53. A method as recited in claim 51, wherein the <u>context of the user</u> comprises the user's current context at the time of activating the search request.

54. A method as recited in claim 51, wherein the <u>context of the user</u> comprises the user's current context at the time of generating the search request.

56. A method as recited in claim 51, wherein the <u>user context</u> comprises information regarding multiple ones of: the user's <u>physical environment,</u> the user's mental environment, the user's computing environment, and the user's data environment.

57. A method as recited in claim 51, wherein the <u>user context comprises physical environment</u> information pertaining to one or more of: the user's location and a time of the search request.

58. A method as recited in claim 51, wherein the <u>user context</u> comprises mental environment information pertaining to one or more of: the user's likely intentions, the user's preferences, and the user's current attention.

59. A method as recited in claim 51, wherein the <u>user context</u> comprises computing environment information pertaining to one or more of: computing capabilities of a client computer being used by the user, available I/O devices of the client, processing capabilities of the client, and available storage space on the client.

61. A system comprising: a characterization module configured to characterize a <u>user's context</u>; and a <u>search criteria</u> generator configured to generate <u>search criteria</u> corresponding to a user search request, wherein the <u>search criteria</u> is coupled to receive a user search request via one or more input devices, and further coupled to receive the <u>user's context</u> from the characterization module.

62. A system as recited in claim 61, wherein the characterization module is configured to characterize the user's content based on input received from a plurality of sensors, wherein the plurality of sensors sense one or more of: the user's <u>physical environment,</u> the user's mental environment, the user's computing environment, and the user's data environment.

63. A system as recited in claim 61, wherein the <u>user's context comprises physical environment</u> information pertaining to one or more of: the user's present location and the current time.

64. A system as recited in claim 61, wherein the <u>user's context</u> comprises mental environment information pertaining to one or more of:the user's likely intentions, the user's preferences, and the user's current attention.

65. A system as recited in claim 61, wherein the <u>user's context</u> comprises computing environment information pertaining to one or more of: computing capabilities of a client computer being

used by the user, available I/O devices of the client, processing capabilities of the client, and available storage space on the client.

66. A system as recited in claim 61, wherein the user's context comprises data environment information pertaining to data and software resources on a client computer being used by the user.

67. A system comprising: means for receiving a user search request; means, coupled to the means for receiving, for identifying context information for the user; and means for combining the user search request and the current context information to generate search criteria corresponding to the user search request.

68. A system as recited in claim 67, wherein the context information comprises information regarding one or more of: the user's physical environment, the user's mental environment, the user's computing environment, and the user's data environment.

69. A system as recited in claim 67, further comprising: means for communicating the search criteria to one or more search components; means for receiving search results from at least one of the one or more search components; and means for presenting the search results to the user.

Hit List

Search Results - Record(s) 1 through 14 of 14 returned.

☐ 1. Document ID: US 20040249821 A1

Using default format because multiple data bases are involved.

L6: Entry 1 of 14   File: PGPB   Dec 9, 2004

PGPUB-DOCUMENT-NUMBER: 20040249821
PGPUB-FILING-TYPE: new
DOCUMENT-IDENTIFIER: US 20040249821 A1

TITLE: Automated support of user interaction with information resources

PUBLICATION-DATE: December 9, 2004

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY	RULE-47
Nies, Zach	Denver	CO	US	
Pope, Cameron	Denver	CO	US	
Phillips, John	Denver	CO	US	
Klanjsek, Milan	Denver	CO	US	
Lemmons, Mark	Denver	CO	US	
Schuster, David	Denver	CO	US	

US-CL-CURRENT: 707/100

| Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Draw Desc | Image |

☐ 2. Document ID: US 20040054690 A1

L6: Entry 2 of 14   File: PGPB   Mar 18, 2004

PGPUB-DOCUMENT-NUMBER: 20040054690
PGPUB-FILING-TYPE: new
DOCUMENT-IDENTIFIER: US 20040054690 A1

TITLE: Modeling and using computer resources over a heterogeneous distributed network using
semantic ontologies

PUBLICATION-DATE: March 18, 2004

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY	RULE-47
Hillerbrand, Eric T.	Atlanta	GA	US	
Padmalyan, Girish	Atlanta	GA	US	
Pauly, Michelle	Duluth	GA	US	
Park, Jhong-Hee	Suwanee	GA	US	
Kumar, Sujith	Atlanta	GA	US	

Glasgow, William S.	Peachtree City	GA	US
Murakonda, Sambasiva	Marietta	GA	US
Sebel, Tim D.	Atlanta	GA	US
Velmuran, Vivekanand	Chamblee	GA	US
Basu, Chitta	Planboro	NJ	US

US-CL-CURRENT: 707/104.1

| Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Draw Desc | Image |

☐ 3. Document ID: US 20030131016 A1

L6: Entry 3 of 14   File: PGPB   Jul 10, 2003

PGPUB-DOCUMENT-NUMBER: 20030131016
PGPUB-FILING-TYPE: new
DOCUMENT-IDENTIFIER: US 20030131016 A1

TITLE: Automated system and methods for determining the activity focus of a user a computerized environment

PUBLICATION-DATE: July 10, 2003

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY	RULE-47
Tanny, Hanny	Denver	CO	US	
Knabel, Brad	Denver	CO	US	
Pope, Cameron	Denver	CO	US	
Nies, Zach	Denver	CO	US	

US-CL-CURRENT: 707/102

| Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Draw Desc | Image |

☐ 4. Document ID: US 20030131013 A1

L6: Entry 4 of 14   File: PGPB   Jul 10, 2003

PGPUB-DOCUMENT-NUMBER: 20030131013
PGPUB-FILING-TYPE: new
DOCUMENT-IDENTIFIER: US 20030131013 A1

TITLE: Automated system and methods for determining relationships between information resources

PUBLICATION-DATE: July 10, 2003

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY	RULE-47
Pope, Cameron	Denver	CO	US	
Nies, Zach	Denver	CO	US	

US-CL-CURRENT: 707/100

| Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Draw Desc | Image |

☐ 5. Document ID: US 20030130995 A1

L6: Entry 5 of 14   File: PGPB   Jul 10, 2003

PGPUB-DOCUMENT-NUMBER: 20030130995
PGPUB-FILING-TYPE: new
DOCUMENT-IDENTIFIER: US 20030130995 A1

TITLE: Automated system and methods for collecting data

PUBLICATION-DATE: July 10, 2003

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY	RULE-47
Pope, Cameron	Denver	CO	US	
Murray, Kevin	Denver	CO	US	
Nies, Zach	Denver	CO	US	

US-CL-CURRENT: 707/3

| Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Draw Desc | Image |

☐ 6. Document ID: US 20030110181 A1

L6: Entry 6 of 14   File: PGPB   Jun 12, 2003

PGPUB-DOCUMENT-NUMBER: 20030110181
PGPUB-FILING-TYPE: new
DOCUMENT-IDENTIFIER: US 20030110181 A1

TITLE: SYSTEM AND METHOD FOR CLUSTERING DATA OBJECTS IN A COLLECTION

PUBLICATION-DATE: June 12, 2003

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY	RULE-47
SCHUETZE, HINRICH	SAN FRANCISCO	CA	US	
PIROLLI, PETER L.	SAN FRANCISCO	CA	US	
PITKOW, JAMES E.	PALO ALTO	CA	US	
CHI, ED H.	PALO ALTO	CA	US	
LI, JUN	SEATTLE	WA	US	

US-CL-CURRENT: 707/103R

| Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Draw Desc | Image |

☐ 7. Document ID: US 20030074369 A1

L6: Entry 7 of 14   File: PGPB   Apr 17, 2003

PGPUB-DOCUMENT-NUMBER: 20030074369
PGPUB-FILING-TYPE: new
DOCUMENT-IDENTIFIER: US 20030074369 A1

TITLE: SYSTEM AND METHOD FOR IDENTIFYING SIMILARITIES AMONG OBJECTS IN A COLLECTION

PUBLICATION-DATE: April 17, 2003

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY	RULE-47
Schuetze, Hinrich	San Francisco	CA	US	
Chen, Francine R.	Menlo Park	CA	US	
Pirolli, Peter L.	San Francisco	CA	US	
Pitkow, James E.	Palo Alto	CA	US	
Chi, Ed H.	Palo Alto	CA	US	
Li, Jun	Seattle	WA	US	

US-CL-CURRENT: 707/103R

| Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Draw Desc | Image |

☐ 8. Document ID: US 20030074368 A1

L6: Entry 8 of 14   File: PGPB   Apr 17, 2003

PGPUB-DOCUMENT-NUMBER: 20030074368
PGPUB-FILING-TYPE: new
DOCUMENT-IDENTIFIER: US 20030074368 A1

TITLE: SYSTEM AND METHOD FOR QUANTITATIVELY REPRESENTING DATA OBJECTS IN VECTOR SPACE

PUBLICATION-DATE: April 17, 2003

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY	RULE-47
SCHUETZE, HINRICH	SAN FRANCISCO	CA	US	
CHEN, FRANCINE R.	MENLO PARK	CA	US	
PIROLLI, PETER L.	SAN FRANCISCO	CA	US	
PITKOW, JAMES E.	PALO ALTO	CA	US	
CHI, ED H.	PALO ALTO	CA	US	
LI, JUN	SEATTLE	WA	US	
GARGI, ULLAS	MOUNTAIN VIEW	CA	US	

US-CL-CURRENT: 707/103R

| Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Draw Desc | Image |

☐ 9. Document ID: US 20020087525 A1

L6: Entry 9 of 14   File: PGPB   Jul 4, 2002

PGPUB-DOCUMENT-NUMBER: 20020087525

PGPUB-FILING-TYPE: new
DOCUMENT-IDENTIFIER: US 20020087525 A1

TITLE: Soliciting information based on a computer user's context

PUBLICATION-DATE: July 4, 2002

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY	RULE-47
Abbott, Kenneth H.	City of Kirkland	WA	US	
Robarts, James O.	City of Redmond	WA	US	
Newell, Dan	City of Medina	WA	US	

US-CL-CURRENT: 707/3

| Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Draw Desc | Image |

☐ 10.   Document ID: US 6778941 B1

L6: Entry 10 of 14   File: USPT   Aug 17, 2004

US-PAT-NO: 6778941
DOCUMENT-IDENTIFIER: US 6778941 B1

TITLE: Message and user attributes in a message filtering method and system

DATE-ISSUED: August 17, 2004

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Worrell; Steven W.	Dayton	OH		
Rogers; Steven K.	Beavercreek	OH		
Kabrisky; Matthew	Dayton	OH		
Amburn; Philip	Dayton	OH		

ASSIGNEE-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY	TYPE CODE
Qualia Computing, Inc.	Beavercreek	OH			02

APPL-NO: 10/ 010789   [PALM]
DATE FILED: November 13, 2001

PARENT-CASE:
CROSS REFERENCE TO RELATED APPLICATION The benefit of prior U.S. Provisional Application No. 60/248,430 filed Nov. 14, 2000 is hereby claimed.

INT-CL: [07] G04 F 1/00, G04 F 10/00, G04 F 3/00, G04 F 5/00, G04 F 7/00

US-CL-ISSUED: 702/176; 709/202, 709/203, 709/206, 709/207, 715/500, 715/501.1, 707/100
US-CL-CURRENT: 702/176; 707/100, 709/202, 709/203, 709/206, 709/207, 715/500, 715/501.1

FIELD-OF-SEARCH: 702/176, 709/206, 709/207, 709/230, 709/202, 715/500, 715/501.1, 707/100

PRIOR-ART-DISCLOSED:

U.S. PATENT DOCUMENTS

PAT-NO	ISSUE-DATE	PATENTEE-NAME	US-CL
5619648	April 1997	Canale et al.	
5905863	May 1999	Knowles et al.	709/206
5924105	July 1999	Punch, III et al.	
6052709	April 2000	Paul	709/202
6073133	June 2000	Chrabaszez	
6073142	June 2000	Geiger et al.	715/500
6192360	February 2001	Dumais et al.	
6199102	March 2001	Cobb	709/206
6202058	March 2001	Rose et al.	
6236768	May 2001	Rhodes et al.	
6356935	March 2002	Gibbs	709/206
6393465	May 2002	Leeds	709/207
6442589	August 2002	Takahashi et al.	709/203
6453327	September 2002	Nielsen	715/500
2002/0016824	February 2002	Leeds	709/207
2002/0198950	December 2002	Leeds	709/206

FOREIGN PATENT DOCUMENTS

FOREIGN-PAT-NO	PUBN-DATE	COUNTRY	US-CL
1 087 315	March 2001	EP	
WO 01/27828	April 2001	WO	

ART-UNIT: 2863

PRIMARY-EXAMINER: Bhat; Aditya S.

ATTY-AGENT-FIRM: Stevens & Showalter LLP

ABSTRACT:

A method and system for filtering messages where the importance of a message is determined by analyzing the message body in conjunction with message attributes. Message body refers to the text in the body of the message, whereas message attributes convey information about the message. In another embodiment, analysis of the user's current computing environment provides additional input to the filtering system. This allows for preferentially weighting messages of user's current interests. Analysis includes computation of feature vectors and subsequent input to a discriminant function. The discriminant function provides a test statistic which is compared to a threshold. If the test statistic exceeds the threshold, the incoming message is passed by the filtering system and may be displayed to the user. In another embodiment, message body and attributes are used to anticipate significant events in a time series, such as streaming financial data.

15 Claims, 16 Drawing figures

Full | Title | Citation | Front | Review | Classification | Date | Reference | Claims | KWIC | Draw Desc | Image

☐ 11.   Document ID: US 6728752 B1

L6: Entry 11 of 14   File: USPT   Apr 27, 2004

US-PAT-NO: 6728752
DOCUMENT-IDENTIFIER: US 6728752 B1

TITLE: System and method for information browsing using multi-modal features

DATE-ISSUED: April 27, 2004

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Chen; Francine R.	Menlo Park	CA		
Schuetze; Hinrich	San Francisco	CA		
Gargi; Ullas	Mountain View	CA		

ASSIGNEE-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY	TYPE CODE
Xerox Corporation	Stamford	CT			02

APPL-NO: 09/ 421770   [PALM]
DATE FILED: October 19, 1999

PARENT-CASE:
CROSS-REFERENCE TO RELATED APPLICATIONS This Application claims the benefit of U.S. Provisional
Application No. 60/117,462, filed on Jan. 26, 1999. This Application is also related to U.S
application Ser. No. 09/425,038, filed on Oct. 19, 1999, now U.S. Pat. No. 6,567,797 entitled
"SYSTEM AND METHOD FOR PROVIDING RECOMMENDATIONS BASED ON MULTI-MODAL USER CLUSTERS," U.S.
application Ser. No. 09/421,416, filed on Oct. 19, 1999 entitled "SYSTEM AND METHOD FOR
QUANTITATIVELY REPRESENTING DATA OBJECTS IN VECTOR SPACE," U.S. application Ser. No.
09/421,767, filed on Oct. 19, 1999 entitled "SYSTEM AND METHOD FOR IDENTIFYING SIMILARITIES
AMONG DATA OBJECTS IN A COLLECTION," U.S. application Ser. No. 09/425,039, filed on Oct. 19,
1999, now U.S. Pat. No. 6,598,054 entitled "SYSTEM AND METHOD FOR CLUSTERING DATA OBJECTS IN A
COLLECTION," and U.S. application Ser. No. 09/421,419, filed on Oct. 19, 1999, now U.S. Pat.
No. 6,564,202 entitled "SYSTEM AND METHOD FOR VISUALLY REPRESENTING THE CONTENTS OF A MULTIPLE
DATA OBJECT CLUSTER," all filed of even date herewith.

INT-CL: [07] G06 F 15/16

US-CL-ISSUED: 709/203; 707/10
US-CL-CURRENT: 709/203; 707/10

FIELD-OF-SEARCH: 707/3, 707/5, 707/6, 707/9, 707/103R, 707/100, 707/10, 709/203, 709/217,
709/218

PRIOR-ART-DISCLOSED:

U.S. PATENT DOCUMENTS

PAT-NO	ISSUE-DATE	PATENTEE-NAME	US-CL
5412774	May 1995	Agrawal et al.	345/804
5442778	August 1995	Pedersen et al.	707/5
5794178	August 1998	Caid et al.	704/9
5893095	April 1999	Jain et al.	707/6
5926185	July 1999	Vyncke et al.	345/619

<u>5999927</u>	December 1999	Tukey et al.	707/5
<u>6415282</u>	July 2002	Mukherjea et al.	707/3

ART-UNIT: 2154

PRIMARY-EXAMINER: Maung; Zarni

ABSTRACT:

A system and method for browsing, retrieving, and recommending information from a collection uses multi-modal features of the documents in the collection, as well as an analysis of users' prior browsing and retrieval behavior. The system and method are premised on various disclosed methods for quantitatively representing documents in a document collection as vectors in multi-dimensional vector spaces, quantitatively determining similarity between documents, and clustering documents according to those similarities. The system and method also rely on methods for quantitatively representing users in a user population, quantitatively determining similarity between users, clustering users according to those similarities, and visually representing clusters of users by analogy to clusters of documents.

26 Claims, 26 Drawing figures

| Full | Title | Citation | Front | Review | Classification | Date | Reference | | | Claims | KWIC | Draw Desc | Image |

☐ 12. Document ID: US 6598054 B2

L6: Entry 12 of 14   File: USPT   Jul 22, 2003

US-PAT-NO: 6598054
DOCUMENT-IDENTIFIER: US 6598054 B2

TITLE: System and method for clustering data objects in a collection

DATE-ISSUED: July 22, 2003

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Schuetze; Hinrich	San Francisco	CA		
Pirolli; Peter L.	San Francisco	CA		
Pitkow; James E.	Palo Alto	CA		
Chi; Ed H.	Palo Alto	CA		
Li; Jun	Seattle	WA		

ASSIGNEE-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY	TYPE CODE
Xerox Corporation	Stamford	CT			02

APPL-NO: 09/ 425039   [PALM]
DATE FILED: October 19, 1999

PARENT-CASE:
CROSS-REFERENCE TO RELATED APPLICATIONS This Application claims the benefit of U.S. Provisional Application No. 60/117,462, filed on Jan. 26, 1999. This Application is also related to U.S. patent application Ser. No. 09/421,770 non-final Action mailed Nov. 7, 2000 entitled "SYSTEM AND METHOD FOR INFORMATION BROWSING USING MULTI-MODAL FEATURES," U.S. patent application Ser. No. 09/425,038 Allowed (Pub) entitled "SYSTEM AND METHOD FOR PROVIDING RECOMMENDATIONS BASED ON

MULTI-MODAL USER CLUSTERS," U.S. patent application Ser. No. 09/421,416 Non-final mailed Jan. 3, 2003 entitled "SYSTEM AND METHOD FOR QUANTITATIVELY REPRESENTING DATA OBJECTS IN VECTOR SPACE," U.S. patent application Ser. No. 09/421,767 Non-final mailed Nov. 3, 2003 entitled "SYSTEM AND METHOD FOR IDENTIFYING SIMILARITIES AMONG DATA OBJECTS IN A COLLECTION," U.S. patent application Ser. No. 09/425,039 Present Application "SYSTEM AND METHOD FOR CLUSTERING DATA OBJECTS IN A COLLECTION," and U.S. patent application Ser. No. 09/421,419 Allowed (Pub) Feb. 12, 2003 entitled "SYSTEM AND METHOD FOR VISUALLY REPRESENTING THE CONTENTS OF A MULTIPLE DATA OBJECT CLUSTER," all filed of even date herewith.

INT-CL: [07] G06 F 17/00, G06 F 15/00

US-CL-ISSUED: 707/103R; 707/104.1, 345/650, 345/700
US-CL-CURRENT: 707/103R; 345/650, 707/104.1, 715/700

FIELD-OF-SEARCH: 707/1-7, 707/100, 707/102-104, 707/500-501, 707/513-516, 707/526, 345/418-422, 345/518, 345/594, 345/621-625, 345/634, 345/650, 345/654, 345/700, 345/708, 345/501, 345/530

PRIOR-ART-DISCLOSED:

U.S. PATENT DOCUMENTS

PAT-NO	ISSUE-DATE	PATENTEE-NAME	US-CL
5619709	April 1997	Caid et al.	707/532
5794178	August 1998	Caid et al.	704/9
6003027	December 1999	Prager	707/5
6289353	September 2001	Hazlchurst et al.	707/102

ART-UNIT: 2172

PRIMARY-EXAMINER: Kindred; Alford

ABSTRACT:

A system and method for browsing, retrieving, and recommending information from a collection uses multi-modal features of the documents in the collection, as well as an analysis of users' prior browsing and retrieval behavior. The system and method are premised on various disclosed methods for quantitatively representing documents in a document collection as vectors in multi-dimensional vector spaces, quantitatively determining similarity between documents, and clustering documents according to those similarities. The system and method also rely on methods for quantitatively representing users in a user population, quantitatively determining similarity between users, clustering users according to those similarities, and visually representing clusters of users by analogy to clusters of documents.

18 Claims, 26 Drawing figures

| Full | Title | Citation | Front | Review | Classification | Date | Reference | | | Claims | KWIC | Draw Desc | Image |

☐ 13. Document ID: US 6567797 B1

L6: Entry 13 of 14   File: USPT   May 20, 2003

US-PAT-NO: 6567797
DOCUMENT-IDENTIFIER: US 6567797 B1

TITLE: System and method for providing recommendations based on multi-modal user clusters

DATE-ISSUED: May 20, 2003 .

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Schuetze; Hinrich	San Francisco	CA		
Pitkow; James E.	Palo Alto	CA		
Pirolli; Peter L.	San Francisco	CA		
Chi; Ed H.	Palo Alto	CA		
Li; Jun	Seattle	WA		

ASSIGNEE-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY	TYPE CODE
Xerox Corporation	Stamford	CT			02

APPL-NO: 09/ 425038   [PALM]
DATE FILED: October 19, 1999

PARENT-CASE:
CROSS-REFERENCE TO RELATED APPLICATIONS This Application claims the benefit of U.S. Provisional
Application No. 60/117,462, filed on Jan. 26, 1999. This Application is also related to Ser.
No. 09/421,770, entitled "SYSTEM AND METHOD FOR INFORMATION BROWSING USING MULTI-MODAL
FEATURES," Ser. No. 09/425,038, entitled "SYSTEM AND METHOD FOR PROVIDING RECOMMENDATIONS BASED
ON MULTI-MODAL USER CLUSTERS," Ser. No. 09/421,416, entitled "SYSTEM AND METHOD FOR
QUANTITATIVELY REPRESENTING DATA OBJECTS IN VECTOR SPACE," Ser. No. 09/421,767, entitled
"SYSTEM AND METHOD FOR IDENTIFYING SIMILARITIES AMONG DATA OBJECTS IN A COLLECTION," Ser. No.
09/425,039, entitled "SYSTEM AND METHOD FOR CLUSTERING DATA OBJECTS IN A COLLECTION," and Ser.
No. 09/421,419, entitled "SYSTEM AND METHOD FOR VISUALLY REPRESENTING THE CONTENTS OF A
MULTIPLE DATA OBJECT CLUSTER," all filed of even date herewith.

INT-CL: [07] G06 F 7/00

US-CL-ISSUED: 707/2; 707/3, 707/4, 707/5, 707/10, 709/203
US-CL-CURRENT: 707/2; 707/10, 707/3, 707/4, 707/5, 709/203

FIELD-OF-SEARCH: 707/3, 707/4, 707/5, 707/10, 707/2, 709/203

PRIOR-ART-DISCLOSED:

U.S. PATENT DOCUMENTS

PAT-NO	ISSUE-DATE	PATENTEE-NAME	US-CL
5442778	August 1995	Pedersen et al.	395/600
5546475	August 1996	Bolle et al.	382/190
5619709	April 1997	Caid et al.	395/794
5675819	October 1997	Schuetze	395/760
5778362	July 1998	Deerwester	707/5
5794178	August 1998	Caid et al.	704/9
5867799	February 1999	Lang et al.	707/1
5870740	February 1999	Rose et al.	707/5
5920859	July 1999	Li	707/5
5987446	November 1999	Corey et al.	707/3
6003027	December 1999	Prager	707/5
6049777	April 2000	Sheena et al.	705/10
6272507	August 2001	Pirolli et al.	707/513

| 6289353 | September 2001 | Hazlehurst et al. | 707/102 |
| 6327590 | December 2001 | Chidlovskii et al. | 707/5 |

ART-UNIT: 2172

PRIMARY-EXAMINER: Vu; Kim

ASSISTANT-EXAMINER: Pham; Hung

ABSTRACT:

A system and method for browsing, retrieving, and recommending information from a collection uses multi-modal features of the documents in the collection, as well as an analysis of users' prior browsing and retrieval behavior. The system and method are premised on various disclosed methods for quantitatively representing documents in a document collection as vectors in multi-dimensional vector spaces, quantitatively determining similarity between documents, and clustering documents according to those similarities. The system and method also rely on methods for quantitatively representing users in a user population, quantitatively determining similarity between users, clustering users according to those similarities, and visually representing clusters of users by analogy to clusters of documents.

26 Claims, 26 Drawing figures

| Full | Title | Citation | Front | Review | Classification | Date | Reference | | | Claims | KWIC | Draw Desc | Image |

☐ 14. Document ID: US 6564202 B1

L6: Entry 14 of 14   File: USPT   May 13, 2003

US-PAT-NO: 6564202
DOCUMENT-IDENTIFIER: US 6564202 B1

TITLE: System and method for visually representing the contents of a multiple data object cluster

DATE-ISSUED: May 13, 2003

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Schuetze; Hinrich	San Francisco	CA		
Pirolli; Peter L.	San Francisco	CA		
Pitkow; James E.	Palo Alto	CA		
Chi; Ed H.	Palo Alto	CA		
Li; Jun	Seattle	WA		

ASSIGNEE-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY	TYPE CODE
Xerox Corporation	Stamford	CT			02

APPL-NO: 09/ 421419   [PALM]
DATE FILED: October 19, 1999

PARENT-CASE:
CROSS-REFERENCE TO RELATED APPLICATIONS This Application claims the benefit of U.S. Provisional Application No. 60/117,462, filed on Jan. 26, 1999. This Application is also related to

Application No. 09/421,770, entitled "SYSTEM AND METHOD FOR INFORMATION BROWSING USING MULTI-MODAL FEATURES," Application No. 09/425,038, entitled "SYSTEM AND METHOD FOR PROVIDING RECOMMENDATIONS BASED ON MULTI-MODAL USER CLUSTERS," Application No. 09/421,416, entitled "SYSTEM AND METHOD FOR QUANTITATIVELY REPRESENTING DATA OBJECTS IN VECTOR SPACE," Application No. 09/421,767, entitled "SYSTEM AND METHOD FOR IDENTIFYING SIMILARITIES AMONG DATA OBJECTS IN A COLLECTION," Application No. 09/425,039, entitled "SYSTEM AND METHOD FOR CLUSTERING DATA OBJECTS IN A COLLECTION," entitled "SYSTEM AND METHOD FOR VISUALLY REPRESENTING THE CONTENTS OF A MULTIPLE DATA OBJECT CLUSTER," all filed of even date herewith.

INT-CL: [07] G06 F 17/30

US-CL-ISSUED: 707/2
US-CL-CURRENT: 707/2

FIELD-OF-SEARCH: 707/1, 707/2, 707/3, 707/5, 707/6, 707/10, 707/102, 707/104.1, 707/513, 711/121

PRIOR-ART-DISCLOSED:

U.S. PATENT DOCUMENTS

PAT-NO	ISSUE-DATE	PATENTEE-NAME	US-CL
5442778	August 1995	Pedersen et al.	707/5
5867799	February 1999	Lang et al.	707/1
6098064	August 2000	Pirolli et al.	707/2

OTHER PUBLICATIONS

Robert Sedgewick, Algorithms in C++, 1992, Addison Wesley, pp. 35-37.

ART-UNIT: 2175

PRIMARY-EXAMINER: Mizrahi; Diane D.

ASSISTANT-EXAMINER: Mofiz; Apu M

ABSTRACT:

A system and method for browsing, retrieving, and recommending information from a collection uses multi-modal features of the documents in the collection, as well as an analysis of users' prior browsing and retrieval behavior. The system and method are premised on various disclosed methods for quantitatively representing documents in a document collection as vectors in multi-dimensional vector spaces, quantitatively determining similarity between documents, and clustering documents according to those similarities. The system and method also rely on methods for quantitatively representing users in a user population, quantitatively determining similarity between users, clustering users according to those similarities, and visually representing clusters of users by analogy to clusters of documents.

12 Claims, 26 Drawing figures

| Full | Title | Citation | Front | Review | Classification | Date | Reference | | | Claims | KWIC | Draw Desc | Image |

| Clear | Generate Collection | Print | Fwd Refs | Bkwd Refs | Generate OACS |

| Term | Documents |

SEARCH$	0
SEARCH	323830
SEARCHA	4
SEARCHAB	1
SEARCHABILITIES	1
SEARCHABILITY	141
SEARCHABILITYUPDATE	1
SEARCHABLE	5852
SEARCHABLEBATHS	2
"SEARCHABLEDEEDLISTIMPLEMENTOR.JAVA"	1
SEARCHABLELRFC1738	1
(L4 AND (SEARCH$)).PGPB,USPT,USOC,EPAB,JPAB,DWPI,TDBD.	14

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